



# Gas Behavior, the Atmosphere and Weather

Focus: Atmospheric Pressure

Grades K-4

## **Background:**

The collisions of atmospheric gas molecules with surrounding surfaces result in the transfer of their kinetic energy to the surface. The combined force of these collisions on a surface is referred to as atmospheric pressure.

## **Objectives:**

- ✓ Students will demonstrate the movement of gas molecules.
- ✓ Students will demonstrate the force of atmospheric pressure through observation.
- ✓ Students will observe what happens to objects in a vacuum.
- ✓ Students will be able to describe observed phenomena.
- ✓ Students will be able to hypothesize the effect of the atmosphere on falling objects

## **Learning outcomes:**

Learning outcomes from this lesson parallel the 4th grade Ohio proficiency test.

- ✓ Select instruments, make observations and/or organize observations of an event, object or organism.
- ✓ Identify and/or compare the mass, dimensions and volume of familiar objects in standard and/or non-standard units.
- ✓ Analyze a series of events and/or simple daily or seasonal cycles and predict the next likely occurrence in the sequence.
- ✓ Evaluate a simple procedure to carry out an exploration.
- ✓ Identify and/or discuss the selection of resources and tools used for exploring scientific phenomena.
- ✓ Demonstrate an understanding of safe use of materials and/or devices in science activities.
- ✓ Identify characteristics of a simple physical change.



# Vacuum Science Cont.

## Lesson #1: Overview

- ✓ Introduce yourself.
- ✓ Discuss Atmospheric pressure. What is a vacuum?
- ✓ Introduce the altimeter.
- ✓ Explain how this works to measure atmospheric pressure.

## Activity: Atmospheric Pressure

1. Demonstrate the movement of molecules and how their movement and collisions result in "atmospheric pressure" by
  - a. Opening a bottle of perfume and ask why the odor is not immediately detected by all in the room if gas molecules travel at approximately 1000 miles/hour.
  - b. Having a number of students walk in a confined area and then increasing the number of students in the area until no one can move.
2. Vacuum
  - a. Demonstrate the force of atmospheric pressure with hand held vacuum plates or suction cups.
  - b. Demonstrate blowing up a balloon and marshmallows in a vacuum. Discuss the results.
3. Wind and Sound
  - a. Demonstrate a falling feather and a piece of metal in and out of vacuum.
  - b. Discuss wind and what causes it.
  - c. Demonstrate the absence of sound in vacuum.
  - d. Discuss sound and how it travels.